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**REPORT**  
**ON SITES FOR A GRAVING-DOCK.**  
**IN THE HARBOUR OF QUEBEC.**

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Messrs. Kinipple & Morris,  
*ENGINEERS,*  
WESTMINSTER — LONDON — ENGLAND.

September, 1874.

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London, S. W. & Greenock,  
*September, 1874.*

## REPORT ON SITES FOR A GRAVING DOCK.

To the President and Commissioners of the Harbour of Quebec.

GENTLEMEN,

In accordance with your instructions of the 26th of August, we have the honor to inform you that we have carefully examined various localities which have been mentioned to us, as offering facilities for the construction of a Graving Dock, as well as other sites which, on inspection, and examination of the Harbour of Quebec, would suggest as being more or less favorable for such a work.

We would remark that we (in anticipation) commenced examining the Harbour of Quebec as to the best site for a Graving Dock, ten days previous to your instructions, in order to avoid loss of time.

We have found the knowledge acquired of the Harbour of Quebec last year, when we examined it in reference to the contemplated Harbour Improvements, has been of material assistance to us at this time.

We wish further to state that we have been in frequent consultation with Capt. Gourdeau, and availed ourselves of his large experience and intimate knowledge of the tides and currents of the River St. Lawrence, to guide us in the selection of a site for the Graving Dock.

Before proceeding to report on the various sites examined, we think it desirable for your information and consideration of this important question, to state briefly some of the conditions requisite in a

favorable site for a Graving Dock, both as regards its locality and its construction.

ARTICLE 1. If there is a site on any Government Land or property belonging to the Harbour Commissioners which on close examination offers advantages for the construction of a Graving Dock, it should, of course, have the preference above all others, provided that the engineering difficulties are not of such a character as to outweigh the advantage of obtaining the necessary land free of cost, and further that the site is in other respects suitable.

ARTICLE 2. From conversations we have had with many gentlemen well acquainted with the requirements of the Port and Trade of Quebec, we believe it is the general opinion, and one in which we concur, that it is very desirable the Graving Dock should, if circumstances permit, be in some part of the River or Harbour of Quebec, where there is generally open ice all the winter, to enable vessels under repair or otherwise to get away late in the season, or for the accommodation of vessels arriving early in the spring.

ARTICLE 3. The location of a Graving Dock in the River, looking to the facilities and convenience of docking and undocking vessels, should be where there is moderately quiet water, or where the tide or current is tolerably slack, so that entire command can be had over vessels at the time of docking and undocking.

ARTICLE 4. We attach some importance to having railway communication with the Dock, and if a site can be found in the vicinity of a Railway it would be very desirable, looking to the convenience of parties visiting the Dock, and also as affording means for the conveyance of Stores, Materials &c., requisite in the repairing of vessels.

We should propose to construct this Dock on the same principle as the one at Greenock, which is capable (by the use of a special kind of caisson) of being used as a Graving or a Wet Dock: where therefore it is used as a Wet Dock for loading or unloading of vessels the advantage of Railway communication is self evident. The addition to the first cost in making the Graving Dock capable of being used as a Wet Dock is trifling.

ARTICLE 5. A site having a rock foundation is of course generally preferable to any other, and it will be a further advantage if the dip or stratification of the rock be from the River inland.

ARTICLE 6. It is very desirable that the site should permit of the extension of the works inland at any future time without incurring an undue outlay.

ARTICLE 7. Looking to the question of the cost of the Dock, it will be of advantage if the general configuration of the land be such, that the excavated material from the back or rear portion of the Dock, be sufficient or nearly so, to form the banks round the front portion of the dock up to the coping level, and thus form ground upon which to erect, if necessary, the requisite Buildings and Workshops, as well as acting as backing to support the side walls of the dock.

ARTICLE 8. That the Graving Dock should be built—due regard

being had to other considerations—where it would entail the least possible expense in coffer-damming or shutting out of the water during the whole time of executing the works.

ARTICLE 9. In the selection of a site upon which to construct a Graving Dock, it is desirable that it should be placed in such a position where it would be possible to erect a Cofferdam in about twenty-five or twenty-six feet of water at High water, and thus save the heavy cost of blasting or cutting a channel way through a shallow foreshore; or in other words so long as the entrance works are commenced at a point where the rock or bottom is at least two or three feet below the level of the eil;—which would enable a coffer-dam to be erected at the least cost, and on removal would give the required depth outside the eil, and further would allow of the Dock immediately on its completion and removal of the cofferdam, to be used, without resorting to the expense of blasting out the channel-way or approach to the Dock below low water mark.

ARTICLE 10. If the general level of the land be above high water mark it will be advantageous; for in the first place it will save a considerable expenditure in the forming or making up a great width of ground all round the Dock, which would be necessary if the site were covered with water to the extent of four or five feet or more at high water, and further it would allow the inner portion of the works to be proceeded with during the construction of the Cofferdam.

ARTICLE 11. Unless there are strong reasons to the contrary, we are of opinion that a Graving Dock should, if possible, be within a reasonable distance from the centre of business.

ARTICLE 12. The safety of the temporary works from the action of floating ice when the River is clearing itself, must not be overlooked in considering the selection of a site for the Graving Dock.

We trust the foregoing particulars will be found of some service in considering, and making clear the following description of the several sites examined:

In examining the Harbour of Quebec for a site suitable for a Graving Dock, we have inspected both sides of the River, from Wolf's Cove down to the Island of Orleans.

Starting from Wolf's Cove, on the Quebec side of the River, and working towards the India Wharf, we find with one or two exceptions, to be referred to hereafter, there is no room or site for the construction of a Dock without going into deep water, and entailing very great expense in temporary constructive works; and where there is sufficient space in a moderate depth of water with a flat foreshore running inland, there would still be considerable expense (though to a less degree) in coffer-damming or shutting out the water from the whole of the works during their execution.

Any site selected between the above mentioned points would of course entail the purchasing of valuable shipbuilding or other property: further a Dock in this part of the River would have the disadvantage of being closed in with solid ice every winter, and would also be devoid of any Railway communication On the Point Levis side of

the River, starting from Hadlow's Cove, and working towards Henry's upper wharf we find nearly an identical state of things existing as on the opposite side, both as regards deep and shallow water, the purchasing of valuable property, and the closing in of the Dock in winter with solid ice. A Dock on this side will have Railway communication if the proposed extension of the Grand Trunk be carried out.

Therefore a site selected on either side between the points indicated must, as already stated, entail considerable expense in shutting out the water during the construction of the Dock: the outlay on temporary works being of course unproductive, so to speak, great consideration should be given to secure a site where the cost of temporary works would be as small as possible. Suppose for illustration the selected site was at Hadlow Cove, where you have a flat foreshore running out for some distance from the shore to low water mark and covered at high water to the extent of four or five feet, or more, the whole of the sites on all sides would have to be shut in from the River; Some considerable expense would also have to be incurred in making up ground for some width all round the dock, upon which to erect the necessary buildings, and probably some further expense would be necessary in forming an approach from the shore to the Dock.

Before describing the various sites examined as to their advantages or otherwise for the construction of the Graving Dock, we wish to state that there will necessarily be an amount of repetition in speaking of each site, which from the circumstances of the case, cannot be avoided, and arises in a great measure from the foreshores of the River St. Lawrence in the Harbour of Quebec being very similar, and which with few exceptions, have a gentle slope from the shore down to low water mark.

#### SILLERY COVE.

On examination of this Cove we find a flat foreshore running out from the shore for a distance of between six and seven hundred feet to low-water mark, and then rather quicker than a some other coves, getting into deep water; this foreshore is of course covered at high-water.

On looking for any favorable feature in connection with this site, either of an engineering character or otherwise, over other sites of a similar nature, none present themselves: As we have pointed out when speaking of Hadlow Cove—in illustration of a Graving Dock proposed to be built on a low-lying foreshore,—there is first the coffer-daming and shutting out of the water from the whole of the works to avoid tide-work, and to expedite the completion of the Dock: this is necessitated by the circumstance that the working season at Quebec is so short, namely six months.

There is the closing of the dock in winter by solid ice, and the purchasing of valuable property.

As will be gathered from the previous remarks, we are unable to recommend the above site as the one that ought to be selected for the Dock.



## DIAMOND HARBOUR.

On the examination of this Harbour as to its suitability for the construction of a graving dock, we find that by fixing the position of the dock at an angle with the River and the Shore, the necessary length of ground can just be obtained without going into an excessive depth of water.

A Dock placed at an angle with the stream offers great facilities in the docking and undocking of vessels, over one which is square to the stream.

The cliffs would prevent any extension of works at a future time ; the entrance to the dock would come about to the end of the two wharves which divide Mr Blais' property from Mr. Lampson's and be in a depth of water at low water of about thirteen feet, consequently the coffer-dam which would be outside of this and would probably be in sixteen feet of water at low water : to enable some idea to be formed of the nature of the temporary works required here, we would state that the total height of the coffer-dam from the bed of the river, if on rock, would be at the entrance about forty feet, getting less of course as shallower water is approached ;

From the above some notion may be gained as to the necessity of carefully considering how to avoid, not only foundation in an unnecessary depth of water involving expensive and useless work, but of securing a site where the nature of the foreshore would entail, as already alluded to, the least possible expense in temporary or coffer-dam works.

Again as eight feet of water at low water is sufficient over the cill, the foundations would in this case have to be brought up five feet by masonry, to the required level, incurring extra expense, or the whole dock made deeper than is necessary, causing a large additional and useless outlay, besides the cost of the extra five feet in height of coffer-dam. From what has been stated there appears to be no room for the length of dock required, at this Harbour, without going into an unnecessary depth of water, involving in so many ways a useless expenditure of money.

Further the Dock if placed in this Harbour would cause the removal of one or two wharves, and consequently be destroying useful works which would have to be purchased as well as land.

## GLENBURNIE COVE SITE.

There is here a large area of flat rocky foreshore apparently unoccupied, and which at first sight, might appear to be a suitable place for a Graving Dock both as regards its position and construction, but on closer examination a number of adverse circumstances present themselves. We found on taking soundings, at the time of low water, that at a distance of about one hundred and fifty feet out from low water mark, there was only on an average about six feet in depth of water ; to obtain the required twenty-five or twenty-six feet depth of water at high water, it would be necessary for the coffer-dam works to be commenced at a point in the River from about two hundred to two hundred and fifty feet from low water mark ; this would involve the

construction of a great length of coffer-dam of full height, and consequent expense to shut out the water during the execution of the works. A site where the length of coffer-dam would not exceed three or four hundred feet we should consider somewhat favorable in this respect.

The desirability of the works being commenced at about the distance from low water mark as stated above, is to avoid (as mentioned in the first part of this report, article 9) the great expense of blasting under water to form an approach or channel-way to the Dock.

A Graving Dock built on this site would be closed all the winter; the cliffs in the rear would prevent any extension of the Dock, except at considerable cost, and would of course necessitate as in most other cases the purchasing of property, which we presume would be of some value.

This land would enable the Dock to be constructed on a rock foundation, and have railway accommodation in the event of the Grand Trunk extension being carried out.

We should mention that this site would involve the making up of ground all round the Dock at great cost for the erection of buildings and workshops.

After due consideration we find we cannot recommend this site, —though possessing one or two favorable features—as the most suitable for the construction of the Graving Dock.

The next spot which has occupied our attention, is the property lying within two rocky promontories on the Point Levis side of the river, and known, we are informed; as,

#### "CHARLAND'S SHIPBUILDING YARD."

We were attracted to this site as being somewhat suitable for a Graving Dock from the circumstance that the general level of the land inside the promontories was within a few feet of the level of high water, so that with a comparatively small amount of embanking, the water could be kept out from that portion of the work to be constructed within the said promontories, and have the further advantage of the inner or rear part of the Dock being proceeded with, while the necessary temporary works in the river were constructing.

On testing the foreshore by sounding as in the case of Glenburnie Cove, we found almost the same state of things to exist, viz. that of little depth of water at low water, some distance out; the comparatively small inclination of the bottom would necessitate the coffer-dam works being commenced at about two hundred feet out in the river before the required depth of twenty-five or twenty-six feet at high water is reached, unless blasting under water is resorted to, to form an approach or channel-way to the Dock. From many enquiries, we learn there is generally open ice at this point all the winter; the solid ice or batture commencing to make at about Mr. Brunel's wharf, forming rapidly on the north shore or Beauport flats, and taking a curved direction to the Point at the Island of Orleans.



Having, generally speaking open ice all the winter at this point, is we think a favorable feature : any extension of the works in the rear at a future time, could be carried out at a moderate cost : there would be Railway communication with the dock if the extension of the Grand Trunk is constructed as proposed.

There are several drawbacks connected with this site, 1st. It would be necessary to blast away, at considerable cost, a great portion of the rocky promontories to form the ground to coping level,—there would be the coffer-damming or shutting out of the river for one-half the length of works (or more), and the expense of making up of ground in the river to the same extent, or for about half the length of Dock. As at other sites referred to, there would be the purchasing of valuable shipbuilding or other property.

This site, though possessing one or two advantages over that at Glenburnie Cove, is not, in our opinion, the one that should be selected for the construction of the Graving Dock.

#### SITE AT INDIAN COVE.

We have given some attention and thought to the flat rocky foreshore which extends from Mr. Patton's Saw Mills down to Messrs. Gilmour's lower wharf, with regard to its suitability for the construction of the Graving Dock.

As mentioned in the previous portion of this report, we attach some importance to a site where there is generally speaking open ice all the winter ; due consideration of course being given to other circumstances. The advantage of having open ice was exemplified this season when, as we are informed, one of the Allan line of steamers was able to reach Indian Cove some two weeks or more before she could get up the River.

In taking soundings of the river, we find that according to the position fixed on for a site on this shore for a Graving Dock, it would require the coffer-dam works (by reason of the small inclination of the rock bottom) to be commenced at a point from about one hundred and fifty to two hundred feet out into the river from low water mark, to secure the proper depth at low water and avoid all blasting in forming a channelway or approach to the Dock through a shallow foreshore, after the removal of the coffer-dam.

It will be obvious that the remarks previously made in reference to the construction of works on a flat foreshore at other sites already alluded to, must of necessity apply in this case : For instance there would be the large cost of forming a coffer-dam for shutting out of the water from the whole of the works during their execution.

The above temporary works would take a considerable time to construct, but if a site could be found where the inner portion of the permanent works can be carried on simultaneously with the temporary works, much time would be saved : further a Graving Dock constructed on this shore would entail considerable expense in forming and making up of ground for the erection of the necessary buildings and workshops.

Again a roadway or approach from the shore would have to be made to the Dock at some cost.

The Grand Trunk extension as now laid out, does not extend along the Indian Cove shore, therefore a special branch would have to be made to the dock, if built here, should Railway communication be considered desirable.

As in the case of the other sites already adverted to, the question of the purchase of valuable property would have to be taken into consideration, if the Dock were constructed anywhere on this shore between the points mentioned.

For these and other reasons, we are not of opinion that a site anywhere between the before mentioned points, would be the best that can be selected for the construction of the Graving Dock, at the least possible expense

#### ISLAND OF ORLEANS.

We have examined, and given some consideration as to the advisability of the Graving Dock being constructed on the Island.

The first objection which arises, is of course that of the great distance, which a dock built on the Island would be from the centre of business, and the serious inconvenience, and loss of time to parties having to visit the dock; this in our opinion is a great drawback to the Island being selected as the site for the Dock:—Many difficulties will at once suggest themselves when we come to consider the working of the dock after it is built; such as getting shipwrights and other men just when wanted from the main land; the loss of time thereby incurred, &c. The amount of labour required at a Dock is uncertain and fluctuating, and it could hardly be expected that men of this class would live on the Island doing nothing, probably half their time, with no opportunity of getting other work, and solely on the chance of their doing so at the dock.

For many reasons we think it may be considered that a work of such magnitude should be situated on the main-land where every facility can be obtained to meet, in all respects, the varied requirements of a Graving Dock.

As far as we are able to judge, without boring, we should not anticipate any serious Engineering difficulty if the Dock were proposed to be built on a site immediately to the East of the landing Stage, but in the bay still further East, the cost would be very great from being hemmed in by the cliffs in the rear, and great depth of water at the entrance.

Land for the Dock would have to be purchased.

We are not of opinion for the reasons stated, that the Island of Orleans is the site that should be chosen for the Dock

#### SAND BANK SITE, RIVER ST. CHARLES.

The sand bank at the mouth of the river St. Charles has been

considered and thought by many parties a favorable site for the construction of the Graving Dock.

From borings made some time ago by Mr. Symons, we learn that this bank is composed entirely of open and running sand, to a depth varying from twenty to forty feet below low-water mark.

Upon such a foundation we need hardly say it would be highly dangerous to attempt to form or construct a dock, except at a very great cost, by dredging out the sand to a great depth below the water level, and putting in a large mass of liquid Portland cement, and so make an artificial foundation: it is possible to dredge out an area in the form of a Dock, and deposit concrete over this space for ten to twelve feet in thickness, and to bring up roughly the sides to low water mark; by continuing the sides up to coping level, a shell of great strength could be formed out of which water would be pumped and the whole of the sides and bottom lined with masonry, together with the entrance works in the usual way: this method of constructing a Dock would avoid the use of a coffer-dam, and if properly done would give a water-tight Dock, and sufficient weight to resist any pressure that could possibly be brought to bear upon its outer surface.

A Dock of this description could be formed on almost any doubtful foundation, even although it were covered by many feet of water at low-water.

We should of course never advise this method of constructing a Graving Dock except that no other foundation could be obtained.

If it were possible to construct the Dock on this bank at a moderate cost, there would be the advantage, we are informed, of all the necessary land being obtained at a very small expense: as previously mentioned the ice always forms early on the north shore, and would shut up the dock all the winter.

We think it will be already inferred without extending our remarks further, that the cost of constructing a Graving Dock at the mouth of the St. Charles, would be very largely in excess of one built on a site having a good rock foundation, and therefore we do not consider this sand bank the best site that can be selected for the Dock.

#### SITE AT BEAUPORT FLATS.

As there appeared to be some difference of opinion as to the nature or constitution of this flats, we thought it desirable with the view of settling the question at rest to ascertain by bore holes, what was below the surface.

We have sunk in different parts eight bore holes going down to a depth of sixteen feet below low-water level, and we found in each case nothing but sand;

Several of the holes were bored directly under our supervision, and the others under a trustworthy man; the longest time it took to get the tool down to the depth of sixteen feet, was twenty minutes, and in some cases it was even less, we ourselves were able to force the tool down without any difficulty whatever.

We think it very likely that the depth of sand over these flats is probably about the same as that on the bank at the mouth of the River St. Charles.

We might remark that the depth of sixteen feet to which the boring tool was sunk was more than necessary to ascertain whether or not a suitable foundation could be obtained for the purpose of constructing a Graving Dock.

The bore holes extended from the River St. Charles to about Beauport River.

We could not for a moment advise the attempting the construction of a Graving Dock on these flats, for the reasons previously stated when considering the question whether the Graving Dock could be on the sand bank at the mouth of the River St. Charles, and which reasons we think unnecessary to repeat.

The cost of constructing a Graving Dock either on these flats or at the mouth of the River St. Charles would be enormous, probably amounting to fifty or sixty per cent more than on a rock foundation.

#### CAPE ROUGE COVE.

A site has been pointed out to us on land of considerable extent to the East of the Cape Rouge River which, we are informed, is reserved by the Dominion Government of Canada, and is thought can be obtained free of expense.

We have examined this site, and find that it offers no advantages over many others which could be selected in the Harbour of Quebec for constructing the Graving Dock at a moderate cost :

The shore at this point is very shallow consequently the entrance works would have to be commenced, to secure a depth of eight feet of water at low-water, some four hundred feet out from low-water mark, and necessitating a full tide coffer-dam to enclose the whole of the works from the river during construction.

The distance of this site from the City, assuming the land is obtained free of cost, does not in our opinion counterbalance the inconvenience of the dock being so far away from the centre of business.

We therefore feel that we cannot recommend this site, as being, all things considered, the most suitable for the Dock.

#### SITE BETWEEN THE GOVERNMENT WHARF AND MR. PAT- TON'S SAW MILLS, ON THE POINT LEVIS SIDE OF THE RIVER ST. LAWRENCE.

We now wish to draw the attention of the Commissioners to the above site which on close examination and careful study presents the most favorable conditions, for the construction of the Graving Dock and which for the reasons about to be adduced we beg respectfully to submit, should in our opinion be the one selected.

We have stated in the first portion of this report under Articles 1 to 12 inclusive, for the sake of comparison, some of the more important conditions requisite in a good site for the construction and location of a Graving Dock.

We learn the above site is land belonging to the Dominion Government of Canada and therefore we presume can be obtained free of cost, and therefore avoids any outlay in the purchase of valuable property. Mr. Patton holds this ground from the Dominion Government of Canada as a yearly tenant.

As already mentioned, there is generally speaking open ice at this spot all the winter.

Entire command can be had over vessels at this point by reason of tolerably slack water for facilitating the operation of Docking and undocking.

Should Railway communication be considered desirable at any time, this will be secured if the extension of the Grand Trunk is constructed as laid out.

The Graving Dock at this site would be founded on rock with the advantage of the stratification dipping inwards towards the land, which means probably the saving of money in keeping works free of water during construction.

Any extension of the Dock landwards, would not incur any very undue outlay.

Without going into calculations, and subject to the exact position of the Dock being fixed, we may say generally that it will not require any very great amount of extra material for filling up the front or entrance portion of the works beyond what may be obtained from excavations from the Dock.

Less expense will be incurred in coffer-damming or shutting out of the water from the works, during their execution than at any other site.

This site affords the opportunity of constructing a coffer-dam in the required depth of twenty-five or twenty-six feet of water at high-water, the coffer-dam would project a little beyond the line of the present Government wharf; just inside this line we have tested the ground, and found the rock nowhere higher than seven feet below low-water level, and by going out a few feet into the River this depth can if necessary be increased, consequently on the removal of the dam at the completion of the works, the Dock could be used immediately and all expense of blasting below low-water to form an approach or channel-way to the dock, saved:

Capt. Bayfield states in his work on the Tides and currents of the River St. Lawrence, for the use of Pilots, that the low-water level, is lower in the River in the month of August, by about two feet, than at any other time of the year: We took all our principal sound; in 28 at low-water spring tides in this month, when the river was low, the seven feet to level of rock below low-water, will give, at ordinary

low-water, twenty or more over sill at high water neap tides, or about twenty-five feet at high-water spring-tides,

Nearly one-half of the land at this site where the Dock would be built, is above high-water mark, this affords the opportunity of the inner portion of the permanent works being proceeded with while the coffer-dam is being constructed; for expediting the completion of the works, and if hereafter deemed advisable, an inner coffer-dam could be made at no great cost, whereby two-thirds of the permanent works could be gone on with.

Again the level of the land at the back of the site being above high water mark, no filling or making up of ground for this portion would be required, for the erection of the necessary buildings and workshops which could be placed here.

This site for the construction of the Graving Dock, will we think be considered within a reasonable distance from the centre of business.

We believe there would be little or no danger to the temporary works from ice, seeing that at this point the river is generally open all the winter, and further the present Government wharf would no doubt afford some protection.

It might be asked whether there would be any danger to vessels from the reef of rocks near this point at the time of docking, we have tested, and examined the mouth of the entrance of the proposed Dock by soundings in all directions, and nowhere did we find a less depth than nine feet at low-water, and this only at one spot, which probably is local; the average depth being ten to eleven feet: as the sill of Dock is proposed to be seven feet below ordinary low-water, or about twenty-five feet at high-water springs, it is clear that if a vessel can get into the dock with this depth over sill, of course it is free from danger outside at the entrance, if there is a depth of twenty-seven or thirty feet of water.

The landing barge at the Government wharf would be interfered with during the construction of the dock, and other provision would have to be made for the landing of passengers; further some little inconvenience may occasionally arise to the Ferry Dock, should she happen to wish to get to the Barge just at the time of docking or undocking of a vessel.

We feel that possibly some expression may be desired of us, as to the site which we consider the next best for the construction of the Graving Dock: Putting aside the question of the purchase of land, we beg to say that in our opinion Indian Cove is the next site we should select for the building of the Graving Dock chiefly for the reason of there being open ice at this part of the River all the winter; The cost of a Dock on the flat foreshore at Indian Cove would not be greater than one built on any of the low lying foreshores described in this report

We understand the experiment is shortly to be tried of testing the practicability of navigating the River St. Lawrence in winter: this is a matter upon which we cannot venture an opinion: We me-



rely allude to it here as being an index of the bent of men's minds and perhaps be a forecast of what may come to pass sooner or later: further it might be asked in this question to have any weight or bearing upon the subject now under consideration.

We have made all the necessary surveys and levels of the site adjoining the Government wharf in accordance with this report, from which the detailed drawings and specifications can be prepared, as soon as we receive instructions, for the purpose of obtaining Tenders.

We purpose to submit rough Estimates of the cost of the Graving Dock at the Sites adjoining the Government Wharf and at Indian Cove; the Estimate for the latter will be a guide as to the cost of a Dock (excluding land) on any similar low flat foreshore.

We have the honor to remain gentlemen.

Your Most Obedt. Servants.

KINIPLE & MORRIS.



J. WESTMINSTER CHAMBERS.

London, Greenock,

*September, 1874.*

## SUPPLEMENTARY REPORT.

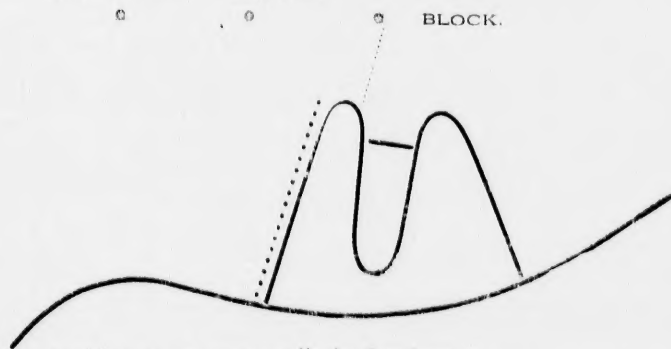
### LAMPSON'S COVE,—LOWER SITE.

To the President and Commissioners of the Harbour of Quebec.

We have examined the lower part of Diamond Harbour at the point mentioned by you, as requested: We had not overlooked this part of the Harbour in our previous survey, but from the proximity of the blocks which would interfere with docking operations, and finding considerable depth of water opposite one of the lower wharves, combined with the extensive shipbuilding business which appeared to be carried on at this part of the Cove, we consider the upper part of the Harbour the more suitable.

By placing the Dock at an angle with the stream and shore as in the former case sufficient length is obtained for the dock.

The lower side of Dock is put in a line with the upper part of the uppermost block (see sketch)



but this block it may eventually be found necessary to remove.

We find the River at about the proposed entrance is shallower than at the two wharves dividing Mr. Blais and Mr. Lampson's properties, where the depth was found to be thirteen feet; though in both cases it is about the same distance out from low-water mark: the average depth at this site is about eight feet six inches and the rock was found by borings ten feet below low-water level.

At this site no favorable engineering features are to be found for the construction of the Dock over any of the others described.

The whole of the works would have to be shut in from the River.

Some expense will be incurred in removing existing wharves, Gridiron, &c.

Ground all round Dock will have to be made up.

There is no room for any extension of works.

No back ground above High water upon which to commence work while coffer-dam is constructing.

We understand that the Tow Boat Company have a lease of this property, with seven years unexpired.

We have incidentally referred to the extension of shipbuilding and other business carried on here.

It is almost superfluous for us to say that this site offers none of the advantages of that at the Government wharf on the Point Levis side of the River.

As decided yesterday we shall submit an estimate of the cost of building a Graving Dock at this spot.

Should this site be selected for the Graving Dock, it will be necessary to have surveys, levels and borings taken for the preparation of the working plans, to obtain tenders, as we have only surveyed the selected site at the Government Wharf.

We have the honor to remain gentlemen,

Your Most Obedt. Servts.

KINPLE & MORRIS.

